

10/527181

PATENT COOPERATION TREATY

PCT

REC'D 05 JAN 2005

WIPO

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 20021748 WO	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/FI 2003/000706	International filing date (day/month/year) 30.09.2003	Priority date (day/month/year) 02.10.2002
International Patent Classification (IPC) or national classification and IPC B03B 13/00, B03D 1/02, G01N 1/20		
Applicant Outokumpu Oyj et al		

- This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 4 sheets, including this cover sheet.
- This report is also accompanied by ANNEXES, comprising:
 - ☒ (sent to the applicant and to the International Bureau) a total of 2 sheets, as follows:
 - ☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

Date of submission of the demand 21.04.2004	Date of completion of this report 21.12.2004
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. +46 8 667 72 88	Authorized officer Jens Waltin/MP Telephone No. +46 8 782 25 00

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FI 2003/000706

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☐ This report is based on a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
- ☐ publication of the international application (under Rule 12.4)
- ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1 - 4 _____ as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☒ the claims:
- pages _____ as originally filed/furnished
- pages* _____ as amended (together with any statement) under Article 19
- pages* 5 - 6 _____ received by this Authority on 04-08-2004
- pages* _____ received by this Authority on _____
- ☒ the drawings:
- pages 1 _____ as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FI 2003/000706

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1-7</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-7</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-7</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

This report is based upon the amended claims filed with the letter of 04-08-2004.

Most relevant documents cited in the International Search Report:

D1: US 6 390 303 B1

D2: US 4 559 134 A

D3: GB 2 188 752 A

D1 relates to a method for optimising addition of oxidising gas and other additives in a mineral recovery process, comprising the steps of: extracting from a slurry a representative sample, treating the sample with an oxidising gas in a step replicating the oxidative conditioning step in the mineral recovery process, measuring one or more parameters of the sample, characterising the slurry as a function of one or more measured parameters and controlling the mineral recovery process in accordance with said characterisation (refer to claims 1-4 and 12).

D2 discloses combined feed-back and feed-forward control of collector addition in a froth flotation process (refer to figure and col. 1, line 60 - col. 2, line 31). The particle size in the tailings is compared to a set point of a flow controller adjusting the rate of collector addition, and the set point is adjusted in relation to the particle size of the slurry in a liquid sample line.

D3 relates to a monitoring method for froth flotation process

.../...

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: BOX V

(refer to figure 1, abstract, page 3, line 26-42 and page 2, lines 63-68). The monitoring method according to D3 involves sensing variations in solids content in a sample of the raw feed, and varying the dosage of flotation reagent employed in the process in accordance with the input variations. The variations in solids content of at least one of the output streams is sensed after a predetermined time lapse. The input and output readings are compared with control data relating input and output solids content.

The invention claimed in claim 1 differs from the methods disclosed in D1-D3 in that the side stream fed to the calibration circuit is formed after a primary grinding stage.

Since the calibration circuit is formed at the earliest stage possible, the results from the calibration can be used in the secondary grinding and conditioning stages. This effect is not obtained by the methods disclosed in D1-D3, where the measured parameters are used only in the flotation stage.

Thus, the invention according to claim 1, as well as claims 2-7 dependent thereupon, is novel and considered to involve an inventive step. It is also considered to be industrially applicable.

PATENT CLAIMS

1. A method for controlling of reagent dosages in a concentration plant based on the variation in the properties of a raw material feed,
5 **characterized in that** the concentration plant contains at least a primary and secondary grinding, conditioning and flotation stages, wherein after the primary grinding stage a representative side stream of the raw material feed is formed, said side stream is fed to a calibration circuit, where variables required in measuring the amount
10 and quality of reagents are determined and the variables obtained are used to dimension the feed of reagents in the main stream.
2. A method according to claim 1, **characterized in that** the calibration circuit contains required conditioning and flotation stages.
15
3. A method according to claims 1 or 2, **characterized in that** after primary grinding the main stream is fed to secondary grinding, to which the product from the calibration circuit is also fed.
- 20 4. A method according to claims 1 or 2, **characterized in that** after primary grinding the main stream is fed to a storage tank.
5. A method according to any of the above claims, **characterized in that** froth formation is measured when dimensioning the quantity and
25 quality of reagent.
6. A method according to any of the above claims, **characterized in that** the amount of concentrate is measured when dimensioning the quantity and quality of the reagent.
30

6

7. A method according to any of the above claims, **characterized in that** the valuable and gangue material content of the concentrate is measured when dimensioning the quantity and quality of the reagent.

5